



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/780,671

02/19/2004

Tapesh Yadav

037768-0114

1995

22428 7590 11/15/2007
FOLEY AND LARDNER LLP
SUITE 500
3000 K STREET NW
WASHINGTON, DC 20007

EXAMINER

VIJAYAKUMAR, KALLAMBELLA M

ART UNIT

PAPER NUMBER

1793

MAIL DATE

DELIVERY MODE

11/15/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/780,671

Applicant(s)

YADAV, TAPESH

Examiner

Kallambella Vijayakumar

Art Unit

1793

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 August 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 6-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

- Claims 1 and 2 were amended. Claims 1-20 are currently pending with the application. Claims 6-20 withdrawn from further consideration.
- Applicants amendment overcomes the prior art by Shall (US 2003/0145681), Bickmore (US 5,984,997) and Gray (US 5,985,173).
- The objection to the Abstract is maintained because it falls short of 50 words although it is less than 150 words as argued by the applicants. See 37 CFR 1.72(a) and MPEP § 606.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. Claims 1-5 are rejected under 35 U.S.C. 102(b) as being anticipated by Lieber et al (US 5,897,945).

Lieber et al teach the composition of acicular nanorods with the formula $M^1_x M^2_y O_z$, wherein the preferred binary oxides include Al_2O_3 and ZnO. The prior art further teaches doped ZnO nanorods with the formula $In:ZnO$. The nanorods had a diameter of 1-200 nm and a length of 0.01-300 microns (Cl-2, Ln 43-51; Cl-3, Ln 27-53; Claims 7-10). In^{3+} and Al^{3+} as dopants meet the limitation of element having

higher oxidation state than Zn (2+) in the claims. With regard to the conductivity in claims 1 and 3, the prior art composition is either same or substantially same as that claimed by the applicants, and identical compositions have identical properties. This is further ascertained over the teachings of Min Yan cited in flowing rejection-6 (Thesis, Northwestern University, Dec 2002). All the limitations of the instant claims are met.

The reference is anticipatory.

2. Claims 1 and 3 are rejected under 35 U.S.C. 103(a) as being obvious over Akhtar (US 5,089,248).

Akhtar teaches the composition of B-doped Zn oxide with a particle size of 0.1-0.2 micron and a resistivity of 2×10 ohm.cm (Cl-3, Ln 37-41; Cl-4, Ln 10-13). All the limitations of the instant claims are met.

The reference is anticipatory.

3. Claims 1-3 are rejected under 35 U.S.C. 102(b) as being anticipated by Seeber et al (Mat. Sci. in Semicond. Processing, 1999 (2), 45-55).

Seeber teaches transparent semiconducting ZnO-Al thin films prepared by spray pyrolysis containing nanosized ZnO:Al crystals with a optical transmission of >85% and adjustable resistivity between 2 and 100 ohms cm (0.5 - 0.01 mho cm) (Abstract;Pg-51, Tabl-2; Pg-54, Fig-8 and its description) that meets the limitation of nanomaterial composition in the claims. All the limitations of the instant claims are met.

The reference is anticipatory.

4. Claims 1 and 4-5 are rejected under 35 U.S.C. 102(b) as being anticipated by Takakura et al (Abstract, MRS Symposium, Fall 2000).

Takakura et al teach the composition containing nanowires (~0.5 nm high and ~20 nm wide) and quantum dots of (Mn Zn) Ferrite. Mn (IV) meets the limitation of dopant element with oxidation state higher than that of Zn. With regard to the conductivity, the examiner takes official notice over Simonet et al (US 4,277,356; Cl-1, Ln Ln 25-35) that discloses a resistivity values of lower than 1000 ohms.cm for Mn-Zn Ferrites. All the limitations of the instant claims are met.

The reference is anticipatory.

5. Claims 1-5 are rejected under 35 U.S.C. 102(a) as being anticipated by Fujishiro et al (Quantum confined Semiconductor nanostructures, MRS Symposium 737, Dec 2-5, 2002, Boston, MA).

Fujishiro et al teach the composition of tube shaped Al(3+)-doped ZnO ceramics with a particle size of 100 nm in diameter and 500 nm in length, and having a DC conductivity of 0.1 Scm^{-1} at 50C that increases with the temperature (Pg-360, Fig-3A and its description; Pg-361, Fig-6; Pg-362, conclusion).

All the limitations of the instant claims are met.

The reference is anticipatory.

6. Claims 1-5 are rejected under 35 U.S.C. 102(a) as being anticipated by Min Yan (Thesis, Northwestern University, Dec 2002).

Yan teaches the composition of Al doped ZnO nanorods with a diameter of 40 nm and having a conductivity of 70.02 S/cm (Pg-125). All the limitations of the instant claims are met.

The reference is anticipatory.

Response to Arguments

Applicant's arguments filed 08/23/2007 have been fully considered but they are not persuasive to overcome the prior art by Lieber (US 5,897,945). The argument that Lieber does not teach Zn doped with an element having oxidation state higher than that of Zn (2+) is not persuasive because the prior art teaches doping with In(3+) and Al(3+) (Res, Pg-5, Last Para). With regard to the argument that PTO relies on inherency that is not correct over the example shown in US Patent 6,344,271 is not persuasive because it is not commensurate in scope for the reason PTO relies on Al/In doped -ZnO versus the Al-doped ZnO claimed by the applicants, and applicants fail to show that the prior art ZnO does not possess the claimed conductivity. This has been further addressed in the rejection cited above. Applicants try to

compare catalytic activity between the mixture of the components and its resultant product obtained upon heat treatment that are structurally different in their arguments and it is not commensurate with the scope of the invention.

For the reason set forth above, applicants fail to patentably distinguish their composition over the prior art.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kallambella Vijayakumar whose telephone number is 571-272-1324. The examiner can normally be reached on 6.30-4.00 Mon-Thu, 6.30-2.00 Alt Fri.

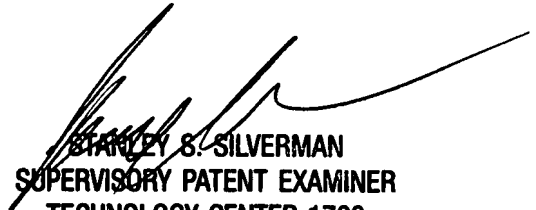
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on 571-272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Application/Control Number:
10/780,671
Art Unit: 1793

Page 6

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/KMV/
11/1/2007



STANLEY S. SILVERMAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700